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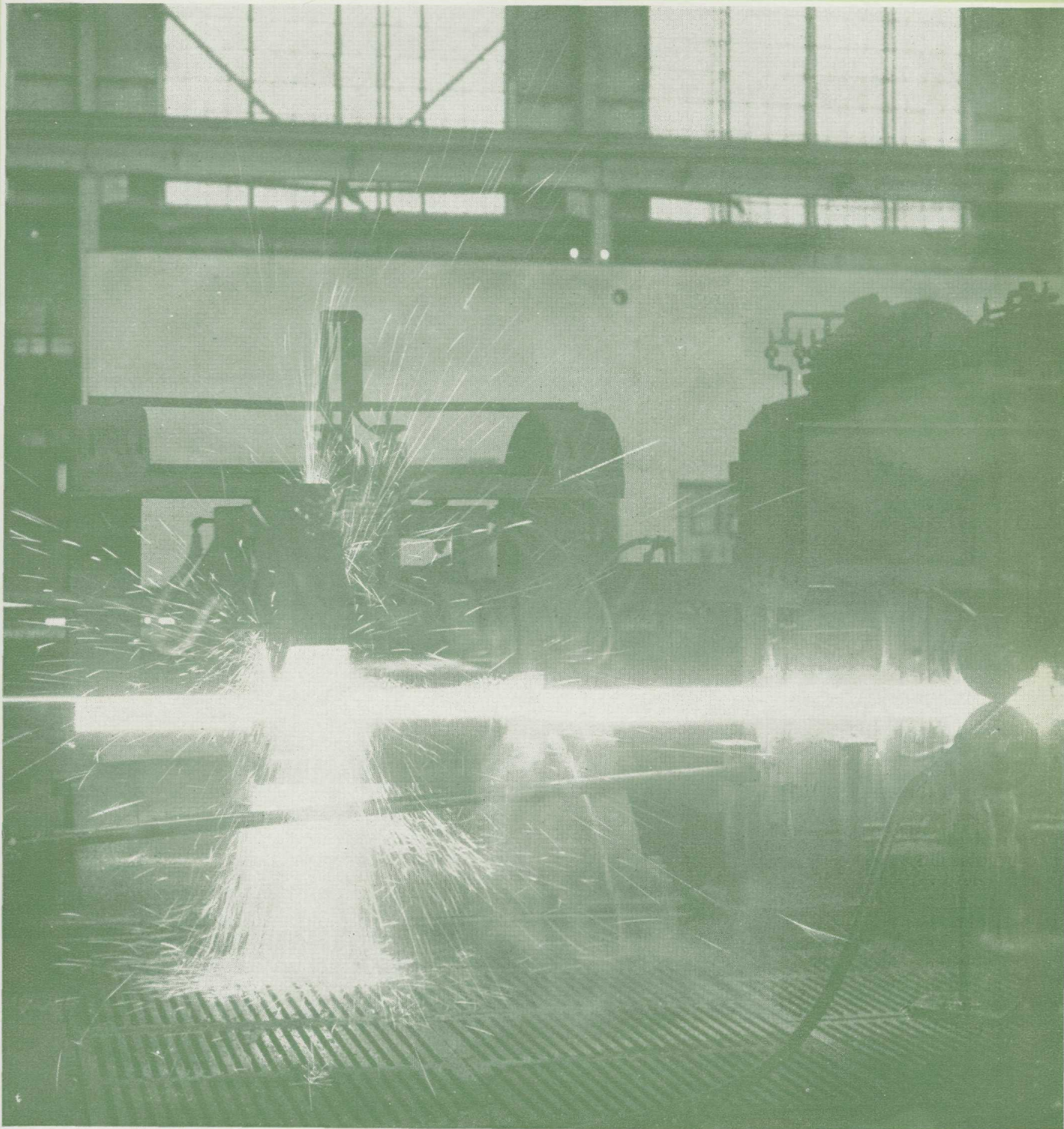
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OHIO STATE ENGINEER



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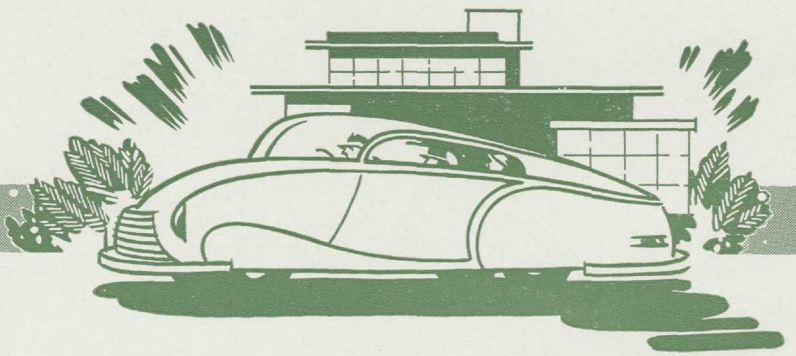
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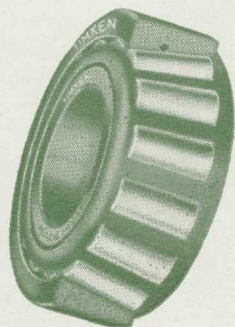


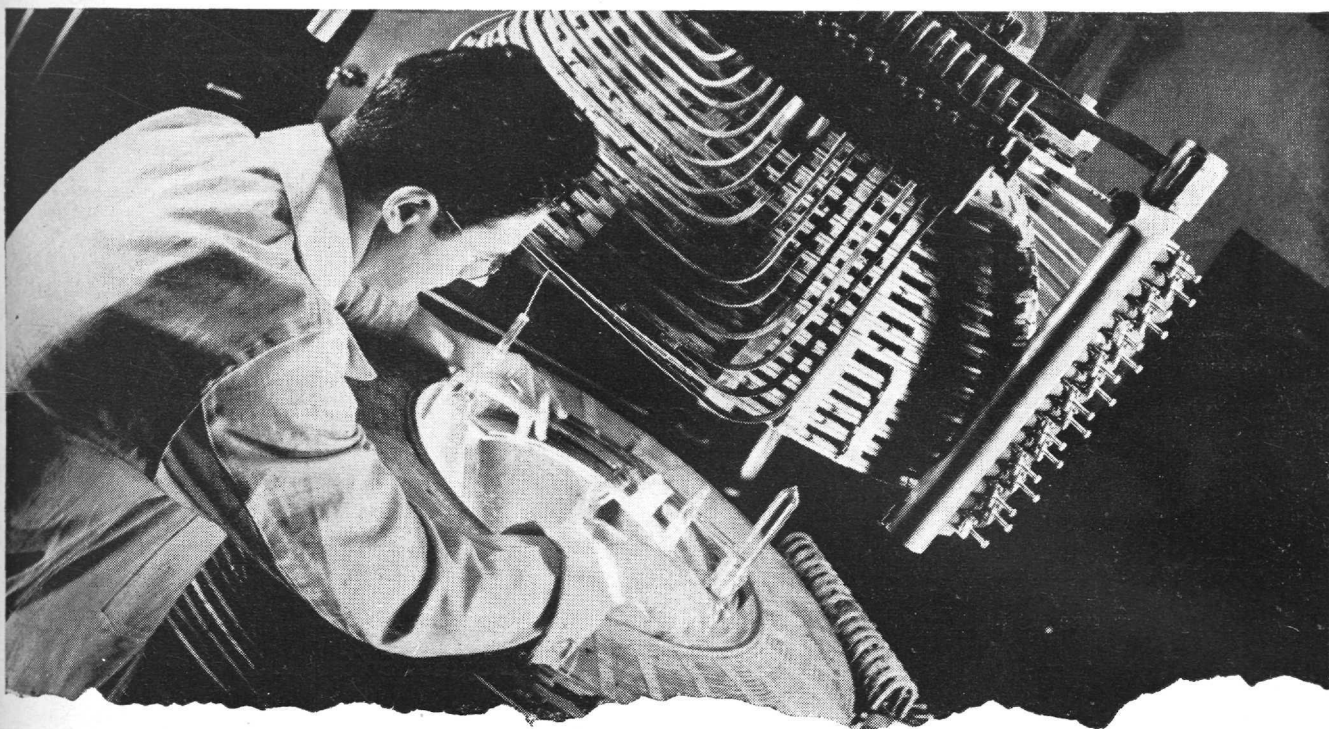
MANY of the veteran engineers responsible for the design of the equipment that is winning the war—tanks, trucks, guns, airplanes, etc.—began to acquire their knowledge of Timken Bearings while in college. Now the results are telling on the battle fronts of the world.

When Victory has been won and industry calls you to help

in the tremendous job of reconstruction, you'll find a thorough knowledge of the design and application of Timken Bearings one of your most valuable assets. Begin to acquire that knowledge now. The Timken Roller Bearing Company, Canton, Ohio.

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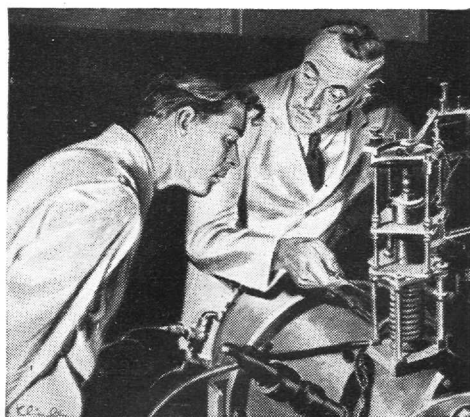
Helping the tire maker: Pictured here is a laboratory model of the new Westinghouse-developed "mass spectrometer," an adaptation of which analyzes gases with incredible swiftness and accuracy. Right now, one of the most important of its many uses is speeding up tremendously a step in the making of synthetic rubber.

Westinghouse research accepts every wartime challenge . . .

Under the spur of war, Westinghouse research is delving into numberless mysteries, not only in the vast field of electricity and electronics, but also in chemistry, physics, metallurgy, plastics. And as a result, out of the great Westinghouse laboratories has come a steady stream of new war products, and new and better ways of making old ones.

Westinghouse research develops new talent for America . . .

To Westinghouse, each year, come several hundred budding scientists and engineers—to work, to learn, to blaze new trails in electrical research. And each year, through more than 100 Westinghouse scholarships, young men enter America's engineering colleges to develop the native skill and talent that have made America great and will make it greater.



Westinghouse research promises new wonders for peace . . .

You have heard much talk of the marvels science will offer you after the War. Well, there *will* be marvels—plenty of them—and Westinghouse research is working to contribute its full share. But we will never lose sight of what we consider our first duty: seeing that, beyond all question, each Westinghouse product, old or new, is the very finest of its kind. Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania. Plants in 25 cities, offices everywhere.



We know what's happening on your campus

Here's what's cooking on ours

We're very much aware of what you are doing.

It's because we are grateful that we want to tell you this.

You've never known industry—not really well. It's probably still a vague place that makes things you buy. You probably think of us as just a place aluminum comes from . . . the aluminum that makes the planes you are going to work with.

But we're people—fathers and older brothers, mothers and sisters, doing the most interesting work we know.

When you come back you'll see this other side of industry. You'll see people figuring out what they can do to make a better world, and you will want to join them, doing something to make the peace rich and worth the fight.

There will be a great many things to be done. A lot of them will be done with aluminum.

Think of all the things the world is going to want in a hurry. A great deal of them will be shipped by air. So they'll be as light as possible. That's one reason why they'll be aluminum.

Millions of things are waiting for someone to make them lighter or more resistant to corrosion, brighter, prettier, cheaper. They'll be made of aluminum, too.

None of that can start till the war's over. But just as soon as our wartime job is done, we mean to make aluminum make a lot of jobs.

And that's what's cooking on our campus. We're studying right now ways of making those jobs. Some of them, we hope, will be right here at Alcoa Aluminum. Still more will be in industries using aluminum for the first time. Wherever they are, they should be exciting.

A PARENTHETICAL ASIDE: FROM THE AUTOBIOGRAPHY OF

ALCOA ALUMINUM



• This message is printed by Aluminum Company of America to help people to understand *what we do* and *what sort of men* make aluminum grow in usefulness.

Stepping Up... and Keeping Up the STEEL CUTTING PRODUCTION of the United Nations



WITH the outbreak of war in 1939, the Allied Nations—abruptly cut off from Germany as a principal source of supply for carbides—diverted the full flood of their carbide demands to the United States.

Fortunately, American industry had established—as far back as 1928—its own independent sources of supply. These American suppliers were ready to meet the emergency with a background of 10 years' experience in the development, manufacture and application of this urgently needed material. They had the skill, the equipment, and a generous margin of reserve capacity.

To the hard pressed Allied Nations—struggling to offset the tremendous output of a German war production long since tooled with carbide *by official decree*—went tons of American carbides in steadily increasing quantities. Foresight and preparedness enabled American carbide manufacturers to fill this urgent need and at the same time meet the pyramiding demands of domestic industries.

Today, you will find carbides a factor of vital importance in stepping up and keeping up the production of not only the United States but also such countries as England, Russia, Australia, Canada, China, India, Mexico and many others among the United Nations.

The full extent to which carbides are being used in the cause of victory is difficult to visualize. Carboloy Company production alone, for example,

is at an annual rate 45 times greater than that of any pre-war year. Monthly production of carbides—formerly measured in pounds—can today be expressed in tons—many tons per month! Yet the average carbide tool contains but a fraction of an ounce of carbide at the cutting edge—and a single tool during its usable life machines hundreds of parts for the implements of war. Particularly important is the use of carbides for cutting steel—a major field of use for Carboloy tools. (More than 60% of the Carboloy Cemented Carbide produced today for machining purposes is for cutting steel.)

A high order of performance—so high as to have been once considered incredible—is now commonly expected, and obtained, with carbides. Such things as increases in output of 3 to 1, lengthened tool life of 10 to 1, finish cuts that eliminate arduous grinding, machining of former “non-machineable” alloys, reductions of 25%, 50%, 75% in machining costs—results such as these are every-day occurrences in war production today.

This widespread use of carbides in war, indicates a new era of production economy when normal commerce returns. Manufacturers who have converted to carbides to meet the present emergency will then have at their immediate disposal an economic weapon of unusual advantage in seeking world markets.

Carboloy Company, Inc., Detroit, Mich.

Authorized Distributors: Canadian General Electric Co., Ltd., Toronto.
Foreign Sales: International General Electric Co., Schenectady, N. Y.



CARBOLOY

TRADEMARK



TITANIUM — TANTALUM — TUNGSTEN CARBIDES

TO THE UTTERMOST ENDS OF THE EARTH

And so, the roads lead away to the uttermost ends of the earth . . . to the South Seas of Captain Cook and Admiral Halsey . . . to the Orient of the Great Khan and General Chiang Kai-shek . . . to the England of Wellington and Churchill. Along every mile of those roads you will find American boys reading American newspapers and magazines . . . "including all the ads, three times"; and American books . . . "right out of their covers."

It's a long road that has no turning, and turn these roads surely will . . . to bring our victorious warriors home to the most wonderful land they will see in all their travels. The doctrine of the divine right of kings is no longer accepted; and the age of unbridled autocracy—the day of irresponsible and ruthless force—is rightfully condemned. The new generation is coming up, inspired with a broader understanding of the world and of human justice—which will lead the people along the roads of intelligence and four-fold freedom for all.

In town and country you see these happy leaders of the new world—pedalling their bikes along the roads with laughter and eager chatter—exploring the endless wonders of the woods and the fields—winning hard-fought but fair and friendly contests on the sandlots. Brimming with healthy curiosity, they demand to know, these boys and girls: "What? Why? When? Where? Who? What does Kettering say? Compton? What is the air-distance?" Engineers, here's a coming new market that demands your best!

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Action photo of a hot saw severing a moving billet. Both the saw and billet move at the same rate.—*Courtesy Westinghouse.*

Our Frontispiece

76 inch, 190,000 pound ingot from annealing furnace being forged into a tube-electric generator shaft by a hydraulic press.— *Courtesy Allis-Chalmers.*

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